JAPIGIDAE OF SOUTH AMERICA I. NEW GENUS AND SPECIES OF THE DINJAPYGINAE

(Diplura)

Leslie M. Smith, *University of California, Davis*

The subfamily Dinjapyginae was erected by Womersley (1934) to contain the single genus *Dinjapyx* Silvestri (1930). This subfamily was characterized by the absence of labial palpi and the presence of sense setae (trichobothria) on antennal segments IV to XX. The genus was established on the male holotype alone and the typical species is *Dinjapyx barbatus* Silvestri. The female is as yet unknown. Our knowledge of the characteristics of the genus was amplified in 1948 when Silvestri described D. *marcusi* and D. *manni*. For each of these species he described both the male and the female. In both species the female was described as possessing large, conspicuous, lateral subcoxal organs, so we may conclude this is a generic character.

In 1951, E. S. Ross and A. E. Michelbacher were collecting insects in Peru for the California Academy of Sciences. They collected two species of the Dinjapyginae which cannot be placed in the genus *Dinjapyx* because the females have no subcoxal organs, and the males have a large bilobed process at the postero-lateral angles of tergite VII, whereas *Dinjapyx* has a single lobe. All previously known japygids, as far as I know, possess subcoxal organs in both male and female, and these structures are present even in the mobile nymphal stages. Since the females herein discussed are without subcoxal organs, I name the new genus *Leipojapyx* from the Greek leipo meaning "to be without."

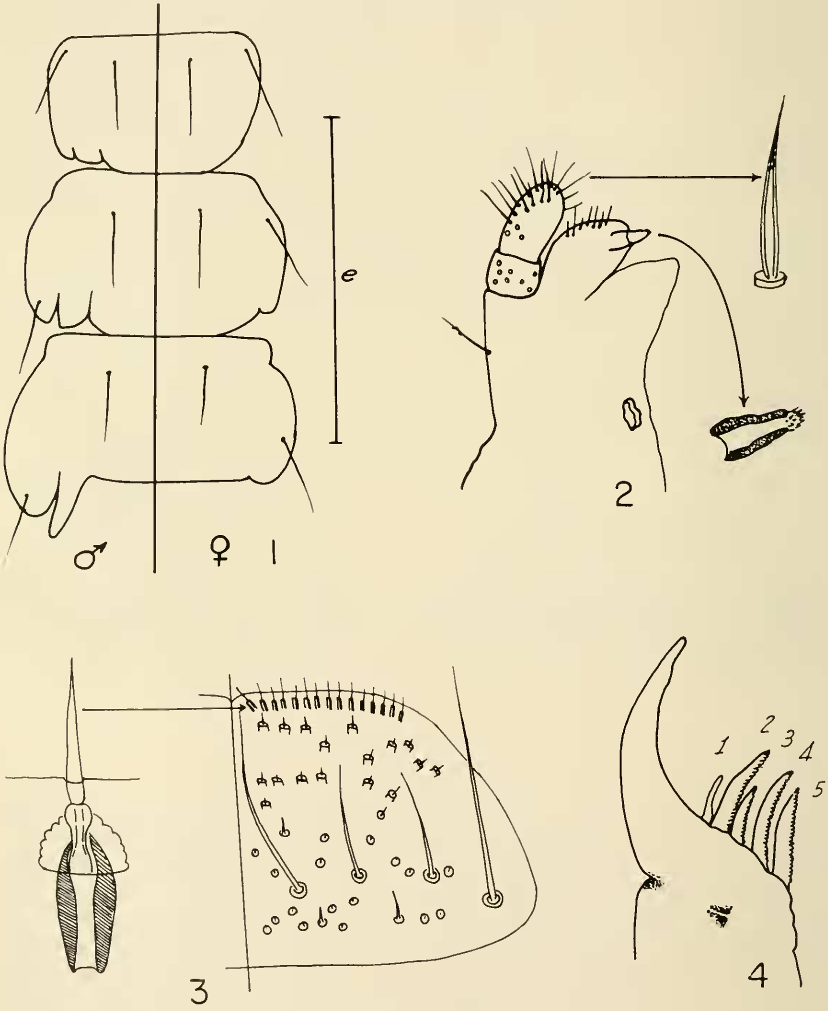
The addition of a new genus and two species in this paper, brings the known members of the Dinjapyginae to two genera and five species. All members of this subfamily were collected at high elevations in the Andes Mountains in Peru and Bolivia. They are all found within 400 miles of one another.

Leipojapyx L. Smith, new genus

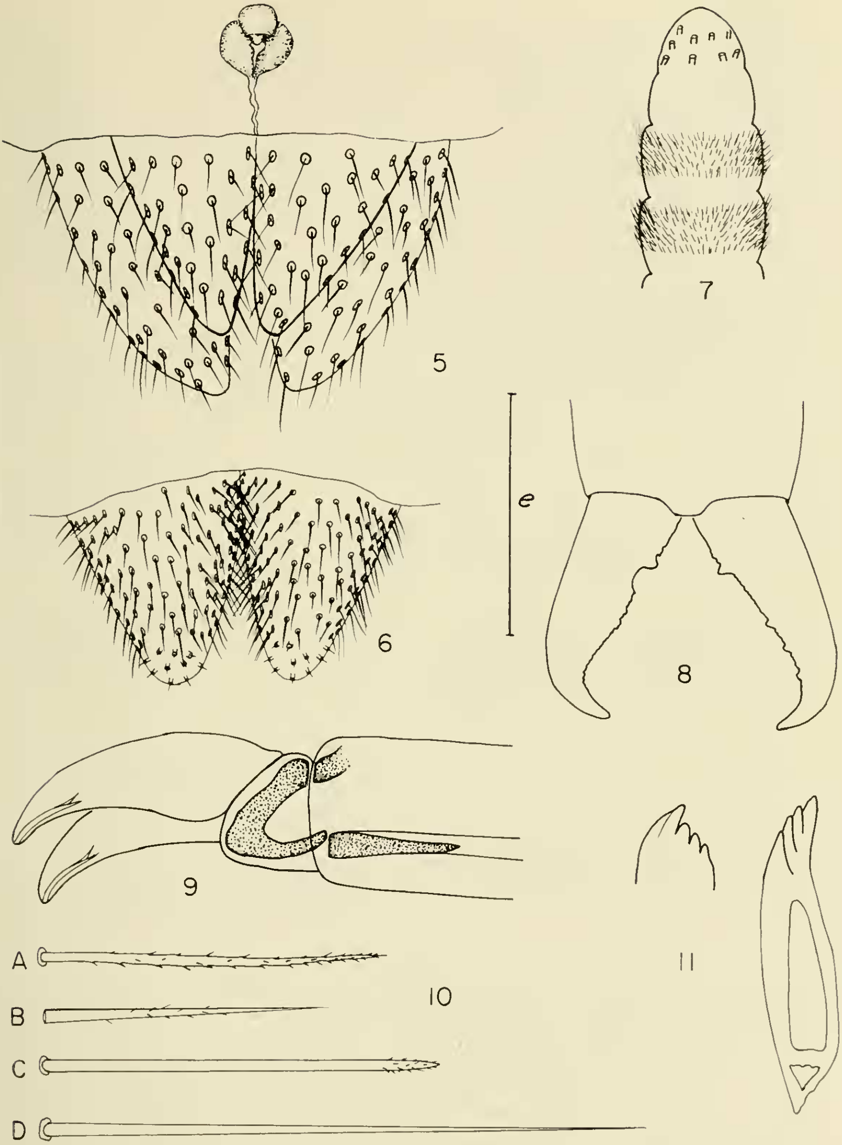
Type species.—Leipojapyx rossi L. Smith

Female.—**Head.** Slightly longer than wide, narrowing slightly anteriorly, with many setae of various lengths; antennae attenuate, many segmented (for example 48 segments in type species), antennal setae dark brown, very long on basal segments, becoming progressively shorter anteriorly, antennal setae biserially pinnate on basal segments, but simple on the distal 15 to 20 segments, segment XX with 400+ setae, becoming fewer toward each end of antenna; sense setae on segments IV to at least XX; in type species IV to XXVII; labrum with a row of special short setae along lower margin, each with a conspicuous heavily sclerotized basal attachment; galea with a heavily sclerotized thumb-like process; lacinia with five laminae: number 1 a short rod, numbers 2, 4, and 5 pectinate, subequal in length, number 3 pectinate, shorter than the other combs; maxillary palpus, two segmented, basal segment ring-like, without setae, distal segment ovoid with many setae, some very long; mandible short, broad, with 4 teeth; labium with numerous long, hollow setae, and a few normal, solid setae; labial palpi absent.

Thorax. Pronotum with many setae of various lengths, some very long; meso- and metanotum with many similar setae; legs relatively short, with numerous setae either simple or minutely plumose near tip; dorsal apex of femur with a close row of 15+ subequal setae all minutely plumose near apices; tarsi with two well-defined



Leipojapyx rossi, n. sp.: fig. 1, tergites V, VI, and VII, left male, right female, only a few of the largest setae shown, e = 4.0 mm.; fig. 2, galea and maxillary palpus, e = 0.82 mm.; fig. 3, front view of right half of labrum and one sensilla enlarged, for labrum, e = 0.45 mm.; fig. 4, lacinia, dorsal view, e = 0.82 mm.



Leipojapyx rossi, n. sp.: fig. 5, genital papillae and spermatheca of female, e = 0.22 mm.; fig. 6, genital papilae of male, e = 0.22 mm.; fig. 7, terminal segments of male antenna, setae omitted from last two segments to show distribution of sensoria, e = 0.24 mm.; fig. 8, tenth segment and forceps, dorsal view, male, e = 2.00 mm.; fig. 9, ungues, pretarsus and tip of tarsal segment, side view, female, setae omitted to show sclerotized internal structures, e = 0.22 mm.; fig. 10, setae (A, seta from lateral subcoxal organ, male; B, tip of tapered seta showing few plumulae, MP; C, blunt, plumose, not-tapered seta, MB; and D long, straight, tapered, simple seta, M); fig. 11, left mandible, ventral view and inset lateral view, e = 1.63 mm.

rows of ventral setae, 10+ setae per row; pretarsus with a large internal sclerotized ventral hook between the claws and a heavily sclerotized internal rod in the tarsus visible only in cleared specimens.

Abdomen. Subcoxal organs absent; abdominal sternites: prescutum with a scattered row of 30+30 or more long subequal setae, scutum with numerous similar setae; styli each with 1 to 3 setae laterad and one sunken seta mesad, or mesad seta may be absent; tergites with posterior corners not projected to the rear; segment X, carinae distinct; tergum with 20+20 or more setae between carinae; sternum with about 50+50; forceps, each with about 100 simple setae of various lengths. Right forcep with one large tooth and many smaller pointed teeth, left forcep with a concave inner margin opposite the large tooth of right forcep, and many smaller pointed teeth; both forceps biserially dentate.

Entire body, (head, thorax and abdomen) covered with minute pores, more or less uniformly spaced from one another at a distance of about 0.02 mm.; large, brown, hair-like setae over whole body set in indistinct setal sockets or no sockets at all; other setae of normal type and hollow setae set in usual type of socket.

Male.—Similar to female except subcoxal organs with a single straight row of identical setae, about 80+80, each minutely plumose; grandular area with scarcely visible pores or setae; posterior corners of tergites VI and VII strongly projected to the rear as a bilobed process; posterolateral corners of segments VIII and IX projected to rear, rounded and heavily sclerotized.

This genus is close to *Dinjapyx* Silv. but can be distinguished by: no subcoxal organs in the female; posterior lobe of galea not sclerotized; sunken seta, mesad, on stylus; tergites V, VI, and VII of the male with postero-lateral angles bilobed.

Leipojapyx rossi L. Smith, new species

Female.—**Head.** Width 2.04, length 2.21 mm. tapering slightly anteriorly; clypeus wtih 5+5 MP[1], occiput with 9+9 MB; antenna with 48 segments, tapering toward the tip, fourth segment width 0.37 mm., fortieth segment width 0.15 mm.; third antennal segment with an apical whorl or 6M much longer than on any other antennal segment, longest seta in the whorl 0.77 mm.; setae on other basal antennal segments about 0.20 mm.; sense setae on segments IV-XXVII; labrum with 4+4 m and about 50+50 hollow microsetae with deep sockets. Lower edge of labrum lined with a tight row of 15+15 hollow microsetae with heavily sclerotized brown internal sockets; mandible with 4 blunt teeth, ventral tooth much thicker than the other three; lacinia falciform, lamina number 1, a rod half as long as lamina number 2, lamina 3 three-fourths as long as lamina number 2, laminae numbers 4 and 5 slightly longer than lamina 2; lamina number 2 pectinate with 23 teeth, laminae 4 and 5 pectinate, with 26 teeth each; posterior lobe of galea not sclerotized, anterior lobe with heavily sclerotized brown thumb bearing about 20 minute teeth at apex, outer surface with 11 short hollow setae; basal segment of palpus ring-like, no setae, but with 10 pores, distal segment ovate with about 20 hollow setae; labium with about 38+38 hollow setae and 1+1 M; labial palpi absent.

---

[1] Abbreviations: M = macrosetae, brown, tapered, not plumose; MP = macrosetae, brown, tapered, plumose; MB = macrosetae, brown not tapered, blunt, plumose; m = submacrosetae, any short setae, more or less hyaline, tapered, simple.

Thorax. Pronotum 16+16 MB and 1+1 M measuring 0.94 mm.; meso- and metanotum: prescutum with about 10+10 MB, scutum with about 33+33 MB irregularly grouped at sides of sclerite; legs: femora with numerous scattered MB, basally a few longer MP; and at the dorsal apex a row of 15 uniform shorter MB; tibiae with numerous scattered MP and some M three of which nearly equal tarsus in length; tarsi with numerous M and no MB or MP; ventral setae per row on tarsus 12.

Abdomen. Tergite 1 prescutum 6+6 MP and 1+1 MB laterad, scutum 19+19 MP; lateral and median subcoxal organs absent; styli short and broad with two simple setae laterad, one twice as long as the other, and one short sunken seta mesad; tergite V postero-lateral angles rounded, not projected to rear; VI with slight lateral indentation suggesting a lobe; VII conspicuous indentation suggesting a lobe, VIII slightly tapered anteriorly, width 2.55, length 1.70 mm., tergite with numerous (50+) M and MB at each side, sternite with 21+29 M and MP, and 1+ MB in each corner; genital opening with one pair of anterior and one pair of posterior papillae each with about 50 m; pleurite on abdominal segments II-IV divided into anterior and posterior parts by a vertical suture with setae as follows II anterior to suture 1 M and 2 MB, posterior to suture 1 M, 9 MB, and 1 m; III anterior, 1 M, 4 MB, and 1 m, posterior 8 M (longest 1.02 mm.), 1 MB, and 7 m; V anterior 3 M, 4 MB (longest 0.26 mm.) and 4 m, posterior 10 M, 2 MB, and 6 m, pleuron on segments II-IV divided horizontally by a fold into dorsal and ventral parts, II dorsal, two irregular rows of 9 setae each (16 M and 2 MB) ventral, upper row 9 M, lower row 9 MB; sternite VIII with 27+27 M and 16+16 m, segment X tapering posteriorly, width 1.87, length 2.38 mm., acropygidium slight, gently rounded; with 1+1 M laterad, 1.10 mm. long, and about 50+50 MB.

Forceps. Biserially dentate from base to tip; right with one prominent tooth, 21 teeth (3 larger than the others) distal to prominent tooth and basally two rows visible in prone profile, one with three teeth and one with one, left forcep with a concavity opposite the prominent tooth on the right arm, with 14 teeth distal to the concavity and basally two rows, one with three teeth and one with one, forcep width 0.77 mm., length 1.53 mm.

Length of body including forceps, 30 mm.

Male.—Similar to female, except lateral subcoxal organs present with 64+60 similar, multilaterally serrate setae in a single row; glands and glandular area present, without visible pores and no glandular setae; tergites V-VII with postero-lateral corners with a bilobed process becoming more developed posteriorly; length of mesad lobe VII 0.51 mm.; forcep width 0.77, length 1.70 mm.

Length of body including forceps, 30 mm.

I have studied a series of 6 females, 6 males, 2 juvenile females and one juvenile male. A few of these have 49 segments in the antennae. They were collected 40 miles east of Abancay, Peru, March 4, 1951. I take pleasure in naming this species after E. S. Ross.

Types.—Holotype and allotype, California Academy of Sciences, paratype ♀ and ♂ U.S.N.M.

Leipojapyx michelbacheri L. Smith, new species

Female.—Similar to *rossi*, except antennae with 45 segments; fourth segment width 0.30 mm., fortieth segment 0.16 mm., third antennal segment with 4 long setae, 3 laterad and one mesad; longest seta in whorl 0.59 mm.; sense setae on segments IV-XXIV.

Male.—Unknown.

I have studied a series of four adult females and one juvenile female. One adult has 44 segments in the antennae. They were collected 20 miles south of Cuzco, Peru by Ross and Michelbacher. I take pleasure in naming this species after Dr. A. E. Michelbacher.

Types.—Holotype ♀ and paratype ♀, California Academy of Sciences, paratype ♀ U.S.N.M.

In his works on the anatomy of *Dinjapyx marcusi* Silv., Dr. Harry Marcus (1948 and 1951) states that these insects feed on moss and algae which grow on rocks or wood. Most of the specimens of *Leipojapyx* which I have studied contain fragments of various insects, but ants predominate. One individual contains parts of approximately 20 ants.

KEY TO THE GENERA AND SPECIES OF THE SUBFAMILY DINJAPYGINAE

1. Females with subcoxal organs; males with postero-lateral angles of tergite VII with a single lobe .... **Dinjapyx** Silv. .. 2
   Females without subcoxal organs; males with postero-lateral angles of tergite VII bilobed .... **Leipojapyx** L. Smith n. gen. . 4
2. Antennae 46 segmented, body 32 mm. .... **D. barbatus** Silv.
   Antennae less than 46 segments 3
3. Body 23 mm., tergite VII distinctly lobed .... **D. marcusi**, Silv.
   Body 18 mm., tergite VII less distinctly lobed .... **D. manni** Silv.
4. Antennae 48 to 49 segmented, sense setae on antennal segments IV to XXVII inclusive .... **L. rossi**, L. Smith, n. sp.
   Antennae 44 to 45 segmented, sense setae on antennal segments IV to XXIV inclusive .... **L. michelbacheri** L. Smith, n. sp.

LITERATURE CITED

Marcus, H., 1948. Estructuras singulares en el *Dinjapyx marcusi* Silv. Folia univ. Cochabamba, Bolivia, 1:66-71.

————, 1951. Observaciones morfologicas en el *Dinjapyx marcusi*. *Ibid.*, 5: 83-105.

Silvestri, F., 1930. Descrizione di un nuovo genere di Japygidae (Thysanuara) del Peru. Boll. del Laboratorio di zool. gen. e agraria, Portici, 23:232-236.

————, 1948. Descrizione di due specie nuove di Dinjapyx (Insecta, Diplura) della Bolivia. Bolletino del Laboratorio di Entomologia Agraria, Portici, 8: 80-85.

Womersley, H., 1934. On the Australian species of Japygidae (Thysanura). Trans. Royal Soc. So. Australia LVIII:37-47.